Parameter Calibration Instrument Instructions

The parameter calibration instrument contains the handheld instrument、the adsorption-type displacement sensor、the charger and the data cable. The instrument can set up wireless communication with the wireless combo sensor and the RTU. The instrument allows operators to browse the dynamometer data stored in the RTU, set and calibrate the parameters of the wireless combo sensor.

Technical Specifications

1. Host Performance

- Processor: ARM7, basic frequency:48MHz;
- Monitor: LCD MGL320240T, Screen size 93×70 mm, Resolution 320×240 pi, extended temperature, backlight;
- Keyboard: Light Touch-tone key, 26 keys;
- USB Port: 2.0;
- Storage: SD card, Capacity: 4GB.

2. Instrument Measuring Range and Accuracy

- Load: 0 ～ 150 KN，   1%F.S;
- Displacement: 0 ～ 10 m,   1%F.S;
- Carrier frequency:2.4GHz
- Communication error: $\leq 10^{-6}$
- Transmission power: ≤10mW
- Time error: ≤ 1 min/year
- Transmission Range: ≤ 500m

3. Host Power Supply

- DC power supply: Lithium Battery, Output: 7.2 VDC, Capacity: 2200mAH, Charging Time: 4 hours;
- Charging mode: charging by dedicated charger;
- Instrument working voltage: 7.0V ～ 8.3V;
- Instrument working current: 100mA;
- Continuous working hours : 24hours;
- Automatic shutdown: Host power automatically turns off if you do not perform any operation and there is no data transmission for more than 10 minutes.

4. Sensor Power Supply

- Dc power: Lithium Battery, Output: 7.2 VDC, Capacity: 2200mAH, Charging Time: 4 hours;
- Charging mode: Charging by dedicated charger;
- Instrument working voltage: 7.0V ～ 8.3V;
- Instrument working current: 70mA;
- Continuous Working hour: 30 hours;
- Automatic shutdown: Sensor power automatically turns into low power consumption mode if there is no

data transmission for more than 10 minutes.

5. Operating Environment

- Temperature: -30 ℃ ~ 70 ℃;

- Humidity: 0 ~ 90 %;

6. Host Size & Weight

- Dimensions: 215 mm x 105 mm x 45 mm (Height x width × Depth);

- Weight: 0.95 kg;

Instrument Functions

1. Test Functions

- Displacement～load indicator diagrams.

2. Analysis and Diagnosis Functions

- Calculate the area of the indicator diagram, polished rod power.

3. Calibration Functions

- Indicator Diagram Sensor Calibration.

- Pressure Sensor Calibration.

4. Data Storage and Playback Functions

- Sore the data of indicator diagram, fluid level and Leakage for over 500 Wells x 100 Times.

- Search well name and the corresponding supporting data.

- Data playback of the indicator diagram.

Instrument Features

- Test the indicator diagram by wireless mode, and the digital transmission of data has improved the reliability and safety of the test, and is easy to operate.

- Large Storage Capacity: 2GB storage, capable to store data of the indicator diagram, the fluid level and Leakage for 500 Wells x 100 Times.

- Low power consumption of the host. Host power automatically turns off to protect the battery if the operator forgets to turn it off.

- Fast test speed, fully functional.

- Long distance of wireless transmission, stable and reliable.

- USB 2.0 port, replay the data fast.

- Small size and light weight, easy to be carried.

- Intelligent battery charger with anti-overcharging and short-circuit protection functions.

Handling Precautions

- Be sure to read this section carefully before you use the instrument in order to use it correctly.

- The instrument is a precision test instrument, and should avoid storage in area subjected to heat source like heater, air conditioning, electric stove, etc. Also avoid storage in area with direct sunlight, rain, dust and large humidity.

- In order to avoid damage the screen. Do not push on the screen or put weight on the instrument.

- Avoid frequent dismantlement of the sensor aerial to avoid bad contact.

- Never place heavy objects on the instrument or otherwise subject the screen to large pressure to avoid damage of the screen.

- Never drop metal objects into the sockets on the panel to avoid short-circuit and damage of the motherboard.
- Never drop the instrument or otherwise subject it to strong impact to avoid damage of the instrument.
- The instrument uses non-memory-effect lithium battery for power supply. Users should timely charge the battery to increase its service life, the battery can be charged for over 700 times with proper use.
- Operate in correct order to avoid system crash

Panel Introduction
Instrument Panel

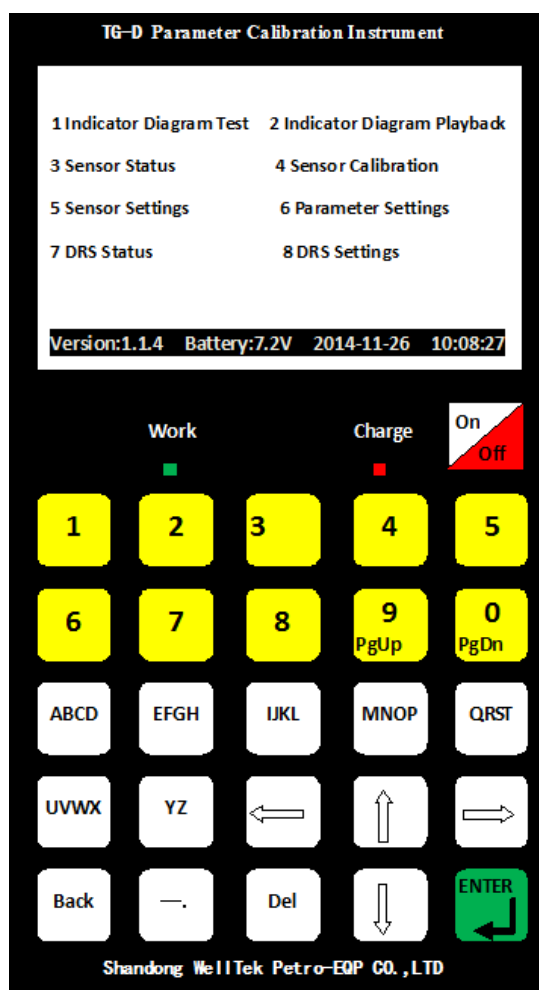The instrument panel is shown below in figure 1

Figure 1 Instrument Panel
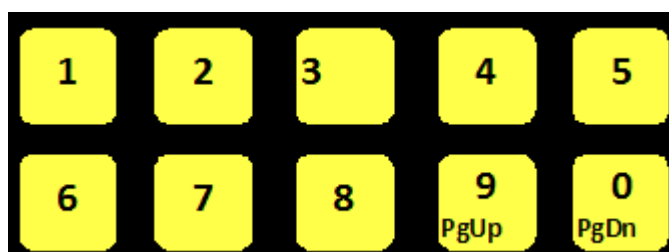
Keyboard

- **Power**

On/Off function: press and hold the key for more than 2 seconds to turn on or turn off the instrument.

- **Indicator Lamp**

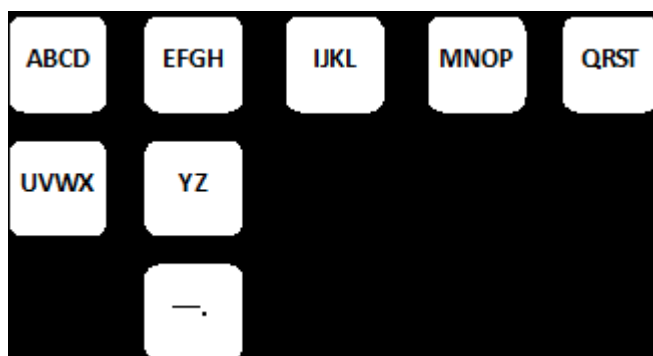Work: opening apparatus, the work lamp lights

Charge: connecting the charger, Charge lamp lights
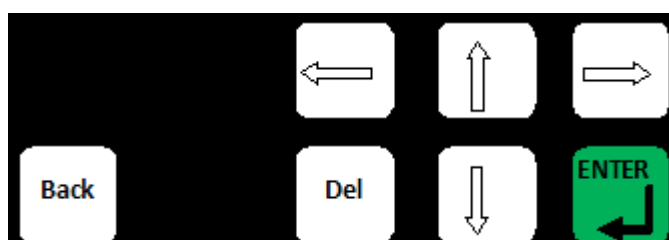

● **Numeric & Function Dual-Use Keys**

This group of keys can be used as the numeric key 0 ~ 9 or otherwise as function keys in specific conditions.

● **Letter Keys and Special Characters**

The letter keys can realize the input of letters from A to Z and two special characters including "-" and ".". Usage: e.g., for the key ABCD, press the key once for "A", press twice, three times and four times consecutively for "B", "C", "D" respectively.

Note: To input two same or different characters in the same key consecutively, press → after inputting the first one, and then input the second one.

● Function Keys

Implement different functions based on the working status of the instrument.

Panel Ports and Adjusting knob

1. Charging Port: Electrical outlet for charging, connect to the dedicated charger to charge.

2. USB Port: To be connected to the computer for data communications.

The On/Off and Backlight Functions

1. Boot: Press and hold the On/Off key for more than 2 seconds until the screen displays the name of the instrument, release the On/Off key, press any key except the On/Off key to enter the main menu screen, or otherwise the instrument automatically enters the main menu screen for 10 seconds without any keystrokes.

2. Shutdown: Press and hold the On/Off key for more than 2 seconds until the screen displays "Thanks for Using", release the On/Off key to turn off the instrument.

3. Backlight: To use the backlight in dim light or dark place, press the On/Off key (no more than 1 second) to turn on/off the backlight.

4. Instrument power automatically turns off if you do not perform any operation and there is no data transmission for more than 10 minutes.

Main Menu

The main menu is shown below (Figure 2).

1 Indicator Diagram Test	2 Indicator Diagram Playback
3 Sensor Status	4 Sensor Calibration
5 Sensor Settings	6 Parameter Settings
7 DRS Status	8 DRS Settings

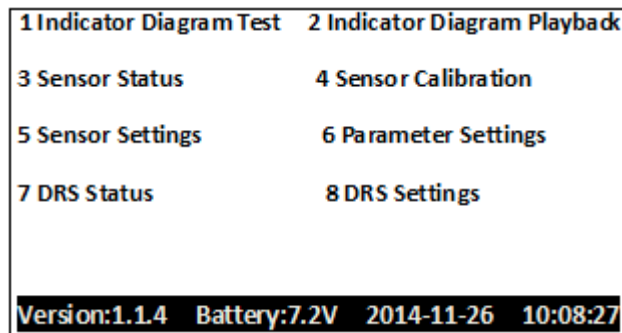Version:1.1.4　Battery:7.2V　2014-11-26　10:08:27

Figure 2 Main Menu

The version of software, battery voltage, date and time is displayed at the bottom of the screen.

Note:

1. The screen displays Warning: SD card failure! when entering the main menu indicates that there is no SD card installed or SD card failure, the SD card should be reinstalled or replaced.

2. The screen displays Warning: New SD card, need initialization! when entering the main menu indicates that the data format of the SD card cannot be recognized, and the card needs to be initialized. Press the Enter key, the screen displays Warning: All data stored in the SD card will be lost, sure to initialize? , then press the Enter key to initialize the card and the screen displays SD card has been initialized!. Note: press the Return key to cancel the card initialization, and the instrument will turn off.

Instrument Charging

The battery voltage can be checked at the bottom of the screen when the instrument is turned on. The instrument will beep twice every 10 seconds to inform the users to charge if the battery voltage is below 7V, and the user should charge the instrument as quickly as possible.

Charging procedure:

1. Turn off the instrument.

2. Plug the hollow plug of the dedicated charger into the charging port of the instrument, and then connect the charger to the 110V A.C power supply. The red light emits and the green light blinks.

3. The green light is on when charging is finished. Unplug the plug at the A.C power supply first and then unplug the plug at the instrument.

FCC STATEMENT:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference,

(2) This device must accept any interference received, including interference that may cause undesired operation.

Warning: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant

to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

RF warning statement

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.